

CLAIMS

[CLAIM 1]

A diversity receiving device that receives a plurality of signals

5 carrier-modulated with digital multivalued modulation, and selects or synthesizes the signals, comprising:

a demodulating unit that demodulates three or more input signals respectively and outputs a complex signal;

a reliability judging unit that calculates a sum of distances from
10 a signal point to another signal point for respective signals using the complex signal, compares the sum of the distances with a given threshold, and outputs a judgement result; and

a synthesizing unit that performs one of selecting at least one signal, and selecting and synthesizing two or more signals according to
15 the judgment result.

[CLAIM 2]

A diversity receiving device that receives a plurality of signals carrier-modulated with digital multivalued modulation, and selects or synthesizes the signals, comprising:

20 a demodulating unit that demodulates three or more input signals respectively and outputs a complex signal;

a reliability judging unit that estimates a mapping point closest to a complex signal out of mapping points used when restoring bit data to an original state thereof from the complex signal, calculates a sum of
25 distances from a mapping point to another mapping point for respective estimated mapping points, compares the sum of the distances with a given threshold, and outputs a judgement result; and

a synthesizing unit that performs one of selecting at least one signal, and selecting and synthesizing two or more signals according to the judgment result.

[CLAIM 3]

- 5 The receiving device as claimed in claim 1, wherein the reliability judging unit has the synthesizing unit select the complex signal if the sum of distances from a signal point to another signal point for the respective signals is lower than the given threshold.

[CLAIM 4]

- 10 The receiving device as claimed in claim 2, wherein the reliability judging unit has the synthesizing unit select the complex signal if the sum of distances from a mapping point to another mapping point for the respective estimated mapping points is lower than the given threshold.

15 [CLAIM 5]

The receiving device as claimed in claim 1, wherein the synthesizing unit adjusts a weighting amount when synthesizing according to the sum of distances from a signal point to another signal point for the respective signals.

20 [CLAIM 6]

The receiving device as claimed in claim 2, wherein the synthesizing unit adjusts a weighting amount when synthesizing according to the sum of distances from a mapping point to another mapping point for the respective estimated mapping points.

25 [CLAIM 7]

A diversity receiving device that receives a plurality of signals carrier-modulated with digital multivalued modulation, and selects or

synthesizes the signals, comprising:

a demodulating unit that demodulates two input signals respectively and outputs a complex signal;

a reliability judging unit that calculates a distance from a signal point to another signal point using the complex signal, compares the distance with a given threshold, and outputs a judgement result calculated according to the comparison result;

a synthesizing unit that outputs reliability information based on the judgement result and synthesizes both of the signal points;

a demapping unit that restores bit data to an original state thereof from the synthesized signal and calculates likelihood in restoring; and

an error correcting unit that performs error correction of the bit data using the likelihood corrected based on the reliability information.

[CLAIM 8]

A diversity receiving device that receives a plurality of signals carrier-modulated with digital multivalued modulation, and selects or synthesizes the signals, comprising:

a demodulating unit that demodulates three or more input signals respectively and outputs a complex signal;

a reliability judging unit that calculates a sum of distances from a signal point to another signal point for respective signals using the complex signal, compares the sum of the distances with a given threshold, and outputs a judgement result calculated according to comparison results in the respective signal points;

a synthesizing unit that outputs reliability information based

on the judgement result and synthesizes the input signal points;

a demapping unit that restores bit data to an original state thereof from the synthesized signal and calculates likelihood in restoring; and

5 an error correcting unit that performs error correction of the bit data using the likelihood corrected based on the reliability information.

[CLAIM 9]

A diversity receiving device that receives a plurality of signals
10 carrier-modulated with digital multivalued modulation, and selects or synthesizes the signals, comprising:

a demodulating unit that demodulates three or more input signals respectively and outputs a complex signal;

a reliability judging unit that estimates a mapping point closest
15 to a complex signal out of mapping points used when restoring bit data to an original state thereof from the complex signal, calculates a sum of distances from a mapping point to another mapping point for respective estimated mapping points, compares the sum of the distances with a given threshold, and outputs a judgement result
20 calculated according to comparison results in the respective signal points;

a synthesizing unit that outputs reliability information based on the judgement result and synthesizes the input signal points;

a demapping unit that restores bit data to an original state
25 thereof from the synthesized signal and calculates likelihood in restoring; and

an error correcting unit that performs error correction of the bit

data using the likelihood corrected based on the reliability information.

[CLAIM 10]

The receiving device as claimed in one of claims 7 through 9, wherein
5 the reliability judging unit outputs information indicating that
reliability is high, as a judgement result, if not fewer than half of the
comparison results for each signal point are lower than the threshold.

[CLAIM 11]

The receiving device as claimed in one of claims 7 through 9, wherein
10 the reliability judging unit stores distances from the respective signal
points to other signal points for a certain previous period and sets an
average value of the distances to a threshold.